

Unit 11

Day 4

Midpoint and Distance

Section 3.1 from book

3.1 Midpoint & Distance formulas

Midpoint Formula- the midpoint of a segment is equidistant to the endpoints of the segment.

Endpoints (a,b) (c,d) has a midpoint of $(\frac{a+c}{2}, \frac{b+d}{2})$

Ex1: Endpoints $(-7,8)$ $(3,1)$

$$\text{midpoint} = \left(\frac{-7+3}{2}, \frac{8+1}{2} \right) \\ \left(-2, \frac{9}{2} \right)$$

Ex2: endpoint $(6,-1)$

midpoint $(-2,5)$

endpoint? (a,b)

$$\frac{6+a}{2} = -2 \quad \frac{-1+b}{2} = 5 \\ 6+a = -4 \quad -1+b = 10 \\ a = -10 \quad b = 11 \\ (-10, 11)$$

Distance formula- used to find the numerical distance between two points in a coordinate plane.

Given two points $A(x_1, y_1)$ & $B(x_2, y_2)$

$$\text{distance} = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

Ex3: Find the distance
between $(5, -3)$ & $(3, 1)$

Ex4: Find the value of r
so $(-4, r)$ & $(-5, 1)$ has
a distance of $3\sqrt{2}$.

$$3\sqrt{2} = \sqrt{(-4+5)^2 + (r-1)^2}$$

$$3\sqrt{2} = \sqrt{1 + (r-1)^2}$$

$$18 = 1 + (r-1)^2$$

$$17 = (r-1)^2$$

$$\pm\sqrt{17} = r - 1$$

HW pg 175-179 1,2,18-24,30-32,64-68 even 71,72,73,77,81
& Wksht 1-3 all